



**UFR DE MÉDECINE
ET DES PROFESSIONS PARAMÉDICALES**

Université Clermont Auvergne



Stratégie de prescription des orthèses de genou

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Orthèses - Généralités

- Dispositifs médicaux externes **appliqués** à un membre/rachis
- **Suppléance fonctionnelle** membre/segment d'un membre ou une partie de rachis

Orthèse =

attelle mais

orthèse ≠ prothèse

(appareil destiné à **remplacer** tout /partie d'un organe ou d'un membre).

- Arsenal thérapeutique non pharmacologique
- Association avec autres interventions (kinésithérapie/ ergothérapie, traitement pharmacologique...)

Orthèses - Classification/fabrication

Selon le mode de fabrication:

Petit appareillage :

- Prescrit sur ordonnance simple
- Orthèses de série : délivrées en pharmacie de ville
- Orthèse thermoformées : différents intervenants (ergothérapeutes, magasins spécialisées, orthoprothésistes)

Grand appareillage:

- sur moulage (par plâtre, par empreinte), par orthoprothésistes
- conception et fabrication assistée par ordinateur (CFAO)
- Prescription par les rhumatologues, MPR, chirurgiens orthopédistes, neurologues...
- Ordonnance de grand appareillage

Orthèses de genou

Genouillères élastiques

Simple

Rotuliennes et fémoro-patellaires

Genouillères articulées de stabilisation

De série

Sur mesure

Genouillères de décharge

De série

Sur mesure

Attelles d'extensions non articulées (d'immobilisation)

Genouillères élastiques



- **Simple**
 - Manchon élastique
 - +/- baleinage latéral (souple)
 - Antalgique (effet chaleur), maintien du genou (effet proprioceptif et haptique)



- **Rotuliennes et fémoro-patellaires**
 - **fenêtre rotulienne** fermé ou ouverte +/- insert rotulien
 - Baleinage latéral (souple)
 - maintien de la rotule en bonne position, proprioception

Genouillères élastiques

Instabilité fémoropatellaire (sévère)

Exemples : Tru-Pull et Tru-Pull light



Genouillères articulées de stabilisation (Genouillères ligamentaires)

Privilégier 4 points (4 sangles transverses)

Baleinage latéral rigide

Articulation mono ou polycentrique

Butées : limitation du secteur angulaire

Indications :

Entorse bénigne/moyenne/grave ou lésion du pivot central

- Phase de reprise activité
- Articulation avec réglage F/E (rééducation en secteur articulaire protégé)

Instabilité ligamentaire et/ou articulaire chronique



Genouillères articulées de stabilisation (Genouillères ligamentaires)

De série



Sur mesure

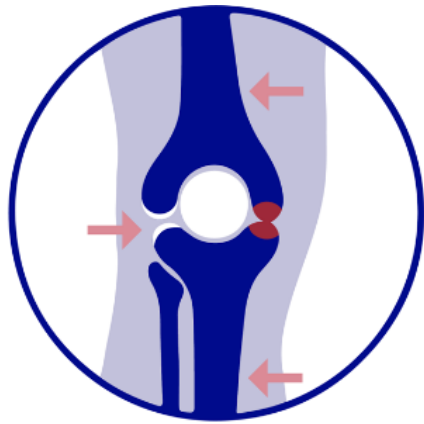


Orthèses de décharge

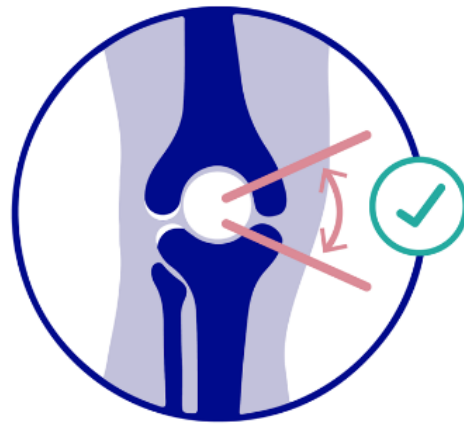
Principe des trois points de décharge

Transfert de la pression hors du compartiment atteint

Arthrose fémoro-tibiale unicompartmentale



3 points d'appui



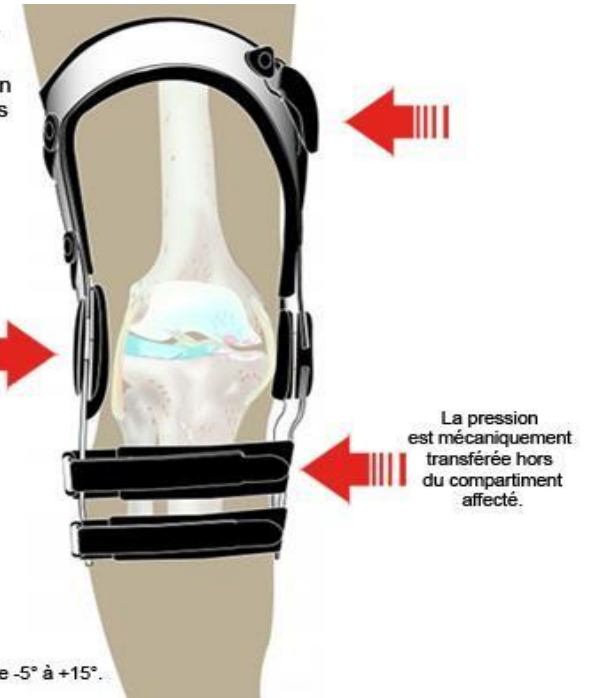
Ouverture d'un angle
pour soulager la douleur

Le système '3 Points d'Appui'

Permet de redistribuer la pression
hors du compartiment atteint vers
le compartiment sain.

La pression est transférée
vers le compartiment sains.

Amplitude de correction varus/valgus de -5° à $+15^{\circ}$.



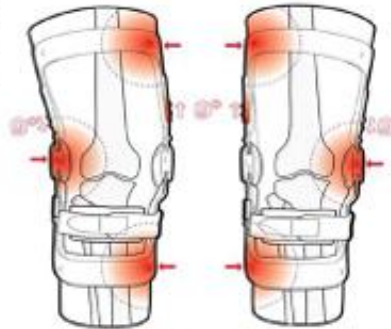
Orthèse valgisante/varisante de série

SCIENTIFIC REPORTS

OPEN Effect of unloading brace treatment on pain and function in patients with symptomatic knee osteoarthritis: the ROTOR randomized clinical trial

Received: 28 November 2017
Accepted: 21 June 2018
Published online: 17 July 2018

Philippe Thoumie¹, Marc Marty^{1,2}, Bernard Arrouet¹, Adeline Paillet³, Arnaud Vaumousse⁴,
Linh Pham Thi Pipet⁵, André Monroche⁶, Nicolas Gravelleau⁶, Armand Bonniau⁶,
Cyrine Ben Amor⁶ & Emmanuel Coudeyre⁶



	Brace group (n = 32)			Control group (n = 35)			Between-Group Difference in Change, Mean (95% CI) ^b	P-value
	Mean (SD)		Change, Mean (95% CI)	Mean (SD)		Change, Mean (95% CI)		
	Baseline ^a	Week 6 ^a		Baseline ^a	Week 6 ^a			
Primary endpoint								
Last 24h-pain (100-mm VAS), mm ^c	63.8 (10.6)	22.2 (19.9)	-41.4 (- 52.7 to -30.0)	64.7 (13.5)	49.0 (23.4)	-15.4 (- 26.2 to -4.6)	-26.0 (- 41.6 to -10.3)	<0.0001
Secondary endpoints								
Pain on motion (100- mm VAS), mm ^c	73.4 (12.7)	26.7 (21.5)	-51.9 (- 63.6 to -40.2)	71.9 (13.8)	59.7 (22.4)	-19.9 (- 31.1 to -8.7)	-32.0 (- 48.2 to -15.8)	<0.0001
Lequesne index score (0-24) ^{d,e}	13.4 (3.7)	7.4 (4.1)	-5.8 (- 6.8 to -4.7)	12.6 (3.2)	10.6 (3.7)	-2.3 (- 3.3 to -1.3)	-3.5 (- 5.0 to -2.0)	<0.0001

Orthèse Rebel Reliever (Inscrit liste LPPR, base de remboursement=380euros, renouvelable tous les 5 ans)

ODRA

Orthèse de Distraction et Rotation pour Arthrose



L'ORTHÈSE ODRA

Les mécanismes actifs révolutionnaires de l'orthèse Odra soulagent très efficacement et rapidement des douleurs liées à l'arthrose du genou en provoquant un effet simultané d'actions.

LA DISTRACTITON À L'INTERNE

À l'extension de la jambe, lors de la phase d'appui, l'articulation interne entraîne un allongement de l'orthèse, ce qui provoque une DISTRACTION entre le fémur et le tibia. Ce mouvement a pour effet de diminuer la pression sur le compartiment douloureux du genou.

LA DISTRACTION À L'EXTERNE

L'articulation externe induit simultanément un recul du centre articulaire ayant pour conséquence une ROTATION externe du pied. Cette rotation permet de contrer le moment d'abduction qui provoque les pincements douloureux dans le genou.

Odra

Gonarthrose fémoro-tibiale du compartiment interne isolé
EVA > supérieure à 40 mm

Osteoarthritis and Cartilage



Clinical Trial

Effectiveness, safety, and cost-utility of a knee brace in medial knee osteoarthritis: the ERGONOMIE randomized controlled trial



M. Gueugnon ¹, I. Fournel ¹, A.-L. Soilly ², A. Diaz ¹, E. Baulot ¹, C. Bussière ¹, J.M. Casillas ¹, A. Cherasse ³, T. Conrozier ⁴, D. Loeuille ⁵, J.-F. Maillefer ⁶, K. Mazalovic ¹, M. Timsit ¹, D. Wendling ¹, A. Ramon ¹, C. Binquet ¹, C. Morisset ¹, P. Ometti ¹

SUMMARY

Objective: This pragmatic, multicenter, open-label, randomized controlled trial (RCT) aimed to compare the effectiveness, safety, and cost-utility of a custom-made knee brace versus usual care over 1 year in medial knee osteoarthritis (OA).

Design: 120 patients with medial knee OA (VAS pain at rest >40/100), classified as Kellgren–Lawrence grade II–IV, were randomized into two groups: ODRA plus usual care (ODRA group) and usual care alone (UCA group). The primary effectiveness outcome was the change in VAS pain between M0 and M12. Secondary outcomes included changes over 1 year in KOOS (function) and OAKHQOL (quality of life) scores. Drug consumption, compliance, safety of the knee brace, and cost-utility over 1 year were also assessed.

Results: The ODRA group was associated with a higher improvement in: VAS pain (adjusted mean difference of −11.8; 95% CI: −21.1 to −2.5); all KOOS subscales (pain: +8.8; 95% CI: 1.4–16.2); other symptoms (+10.4; 95% CI: 2.7–18); function in activities of daily living (+9.2; 95% CI: 1.1–17.2); function in sports and leisure (+12.3; 95% CI: 4.3–20.3); quality of life (+9.9; 95% CI: 0.9–15.9), OAKHQOL subscales (pain: +14.8; 95% CI: 5.0–24.6); and physical activities (+8.2; 95% CI: 0.6–15.8), and with a significant decrease in analgesics consumption at M12 compared with the UCA group. Despite localized side-effects, observance was good at M12 (median: 5.3 h/day). The ODRA group had a more than 85% chance of being cost-effective for a willingness-to-pay threshold of €45 000 per QALY.

Genouillère d'immobilisation

Attelle d'extension (Zimmer)

- Orthèse de série, non articulée
- Baleinage en aluminium latéral et parfois postérieur
- Extension /Flexion 0°- 30° réglable par pliage

N'a quasiment plus de place en pratique courante

Essentiellement en contexte traumatique aigüe

D'une durée la plus courte possible en l'absence de fracture

Ou luxation de rotule (délai 15 jours)

Privilégier attelle articulée dès que possible



Quelle orthèse pour quelle pathologie ?

Traumatisme ?

Récent ou ancien ?

Pathologie fémoropatellaire ?

Niveau d'activité du patient ?

Morphologie du patient ?



Zoom sur la gonarthrose

Le point de vue des praticiens

Facilitators and barriers to orthosis prescription for people with knee osteoarthritis: a qualitative study

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^b Centre de Médecine Physique et de Réadaptation Notre Dame, avenue Joseph Claussat, Chamalières, France

^c Institut Médical Pérignat - Pôle Médecine du Sport, Pérignat-lès-Sarliève, France

Table 1
Physicians characteristics

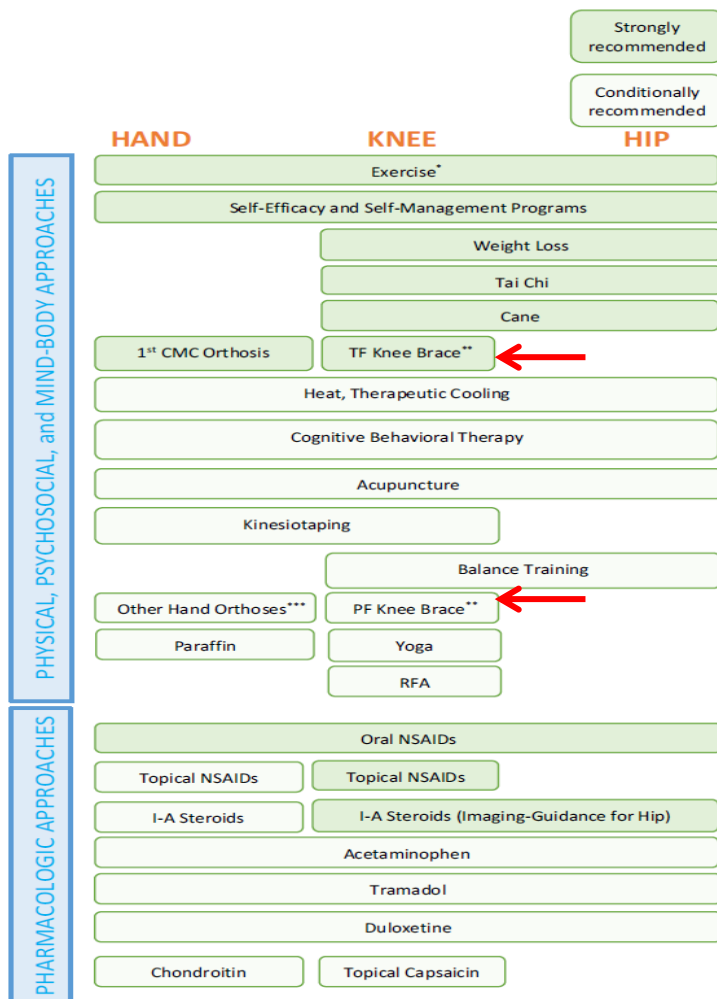
	General practitioner	Sports medicine	Physical medicine and rehabilitation	Rheumatologist	Orthopaedic
surgeon					
Age (years)	36.6 (1.92)	32.4(2.65)	34.0 (2.53)	32.8 (2.32)	35.2 (6.4)
Gender Male/Female	2/3	3/2	3/2	2/3	5/0
Type of exercise					
Hospital	1	3	5	4	3
Private	4	2	0	1	2
Duration of practice	7.6 (1.7)	4.0 (3.5)	5.4 (2.7)	4.2 (2.6)	6 (6.5)
Type of orthoses prescribed					
soft	5	5	5	5	3
rigid	0	2	4	2	4
insole	0	3	3	2	2
Facilitators					
People adherence	4	4	5	4	4
Clinical severity	1	4	5	4	5
Cost	1	2	4	4	2
Habits	1	2	1	0	1
Barriers					
Lack of knowledge	5	3	3	5	3
Cost	3	2	4	3	3
Clinical severity	3	3	2	1	2
Compliance	2	3	1	1	1
Do not think about it	2	2	0	2	0
Negative beliefs	1	3	0	1	0

Data are mean (SD) or numbers.

Zoom sur la gonarthrose

Les recommandations

ACR 2019



SFR-SOFMER 2024

Table 1

French recommendations for the non-pharmacological core management of knee osteoarthritis (OA), with levels of evidence (LoE), strength of recommendation and levels of agreement.

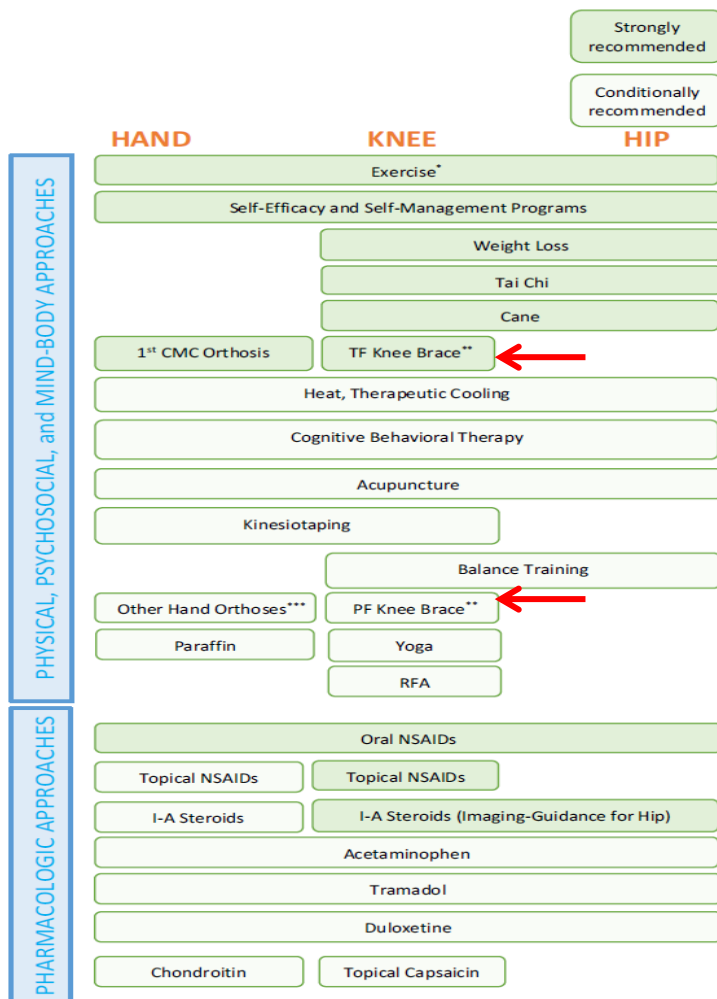
	Strength of recommendation	Level of agreement Mean (SD)
General principles		
A. Optimal management of knee OA should involve both non-pharmacological and pharmacological interventions, with support from healthcare and physical activity professionals.	D	9.82 (0.72)
B. Non-pharmacological management of knee OA must be personalized and based on a shared decision-making process that considers the person's needs and preferences.	D	9.83 (0.45)
C. Long-term adherence to non-pharmacological interventions is crucial and requires regular reassessment.	C	9.65 (0.65)
D. Adapted physical activity, including regular, dynamic, general physical exercise in land-based and/or water-based environments, must be systematically proposed.	B	9.73 (0.57)
E. Person-centered education about knee OA associated with the acquisition of self-management techniques must be systematically proposed.	B	9.15 (1.10)
Specific recommendations		
1. In the presence of pain involving mainly one tibiofemoral compartment, the use of a unicompartamental unloading knee brace can be proposed (LoE = 1A).	B	9.00 (0.97)
2. Kinesiotaping (LoE = 1B) or knee sleeves (LoE = 1B) must not be proposed.	C	7.76 (2.59)
3. Soft shoes with shock-absorbing soles must be recommended (LoE = 4).	C	8.97 (1.47)
4. Use of a cane can be proposed to relieve pain and/or improve walking ability (LoE = 1B).	C	9.03 (1.05)
5. A program of physical land- or water-based exercise targeting the lower limbs must be proposed (LoE = 1A).	B	9.76 (0.61)
6. Joint mobilization must be integrated into the physical exercise program (LoE = 1B).	C	9.27 (0.98)
7. Electrotherapy (LoE = 1B), thermotherapy (LoE = 1B), extracorporeal shockwave therapy (LoE = 1A), laser therapy (LoE = 1A) and electromagnetic therapy (LoE = 1B) must not be used.	C	9.28 (1.44)
8. Acupuncture could be proposed for non-specific analgesic purposes (LoE = 1A).	B	7.97 (2.15)
9. In people with overweight or obesity, a loss of at least 5% of body weight must be targeted (LoE = 1A).	B	9.65 (0.77)
10. A thermal spa treatment integrating person education and physical activity could be proposed (LoE = 1B).	C	8.45 (1.46)
11. People with difficulties at their workplace can be referred to their occupational physician, or alternatively to a center for occupational and environmental diseases to initiate a job retention strategy (LoE = 4).	D	9.18 (1.24)

LoE: level of evidence; OA: osteoarthritis; SD: standard deviation.

Zoom sur la gonarthrose

Les recommandations

ACR 2019



SFR-SOFMER 2024

Table 1

French recommendations for the non-pharmacological core management of knee osteoarthritis (OA), with levels of evidence (LoE), strength of recommendation and levels of agreement.

	Strength of recommendation	Level of agreement Mean (SD)
General principles		
A. Optimal management of knee OA with support from healthcare professionals		9.82 (0.72)
B. Non-pharmacological management that considers the person's context		9.83 (0.45)
C. Long-term adherence to non-pharmacological management		9.65 (0.65)
D. Adapted physical activity, including leisure, sport or professional activity (expert opinion).		9.73 (0.57)
E. Person-centered education about knee OA		9.15 (1.10)
Specific recommendations		
1. In the presence of pain involving the knee, a knee brace can be proposed (LoE = 1B)		9.00 (0.97)
2. Kinesiotaping (LoE = 1B) and knee sleeves (LoE = 1B) must not be proposed.		7.76 (2.59)
3. Soft shoes with shock-absorbing insoles can be proposed (LoE = 1B)		8.97 (1.47)
4. Use of a cane can be proposed to people with difficulty walking (LoE = 1A)		9.03 (1.05)
5. A program of physical land- or water-based exercise can be proposed (LoE = 1B)		9.76 (0.61)
6. Joint mobilization must be integrated into the management (LoE = 1A)		9.27 (0.98)
7. Electrotherapy (LoE = 1B), thermotherapy (LoE = 1A) and electromagnetic fields (LoE = 1A) can be proposed (LoE = 1A)		9.28 (1.44)
8. Acupuncture could be proposed (LoE = 1A)		7.97 (2.15)
9. In people with overweight or obesity, weight loss can be proposed (LoE = 1A)		9.65 (0.77)
10. A thermal spa treatment integrated into the management can be proposed (LoE = 1A)		8.45 (1.46)
11. People with difficulties at their center for occupational and environmental diseases to initiate a job retention strategy (LoE = 4)		9.18 (1.24)

LoE: level of evidence; OA: osteoarthritis; SD: standard deviation.



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Original article

A decision-making tool to prescribe knee orthoses in daily practice for patients with osteoarthritis



Emmanuel Coudeyre ^{a,*}, Christelle Nguyen ^{b,c,d}, Aurore Chabaud ^a, Bruno Pereira ^e, Johann Beaudreuil ^f, Jean-Marie Coudreuse ^g, Philippe Deat ^h, Frédéric Sailhan ⁱ, Alain Lorenzo ^j, François Rannou ^{b,c,d}

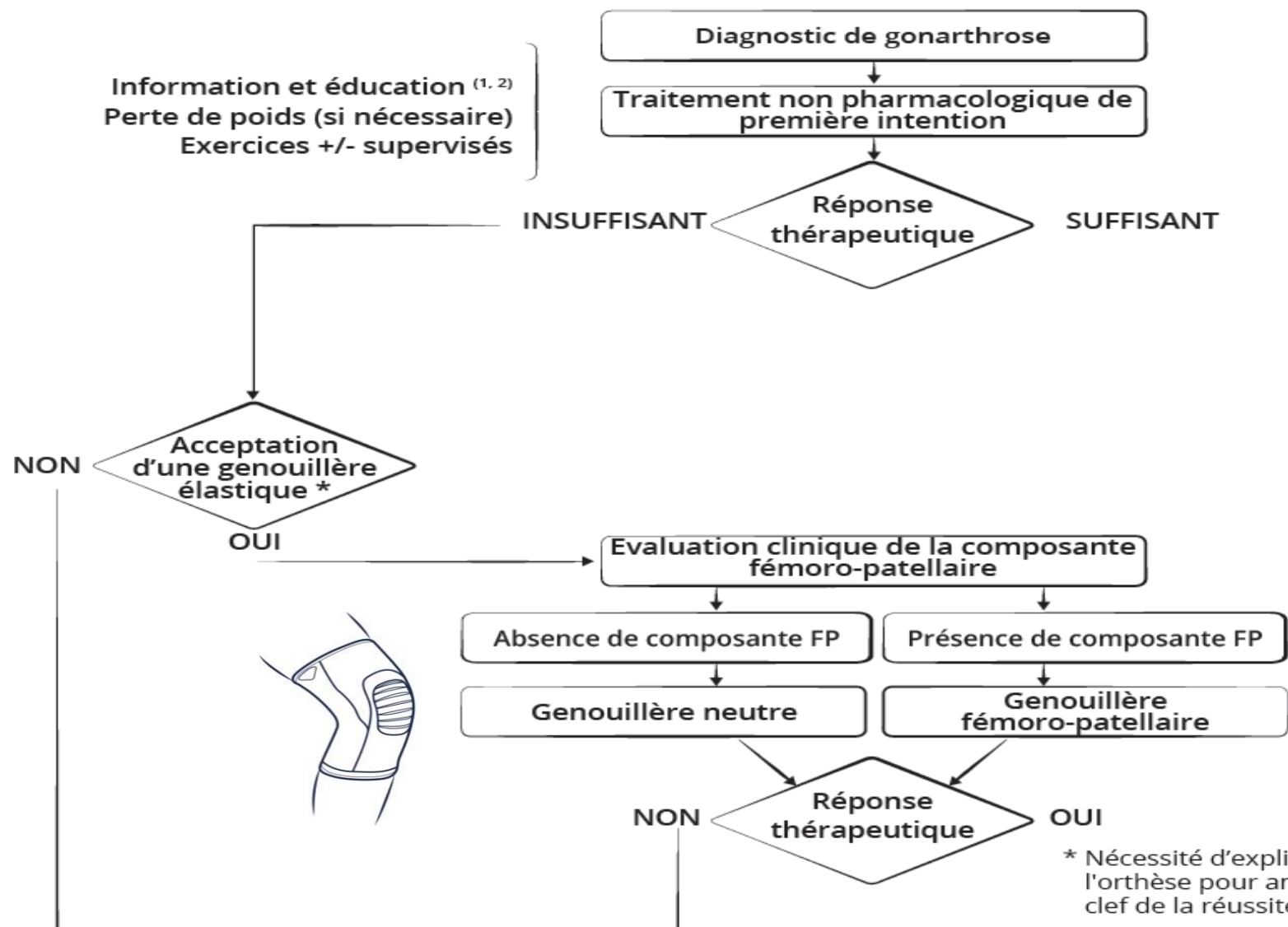
ABSTRACT

Objective: To develop a decision-making tool (DMT) to facilitate the prescription of knee orthoses for patients with osteoarthritis (OA) in daily practice.

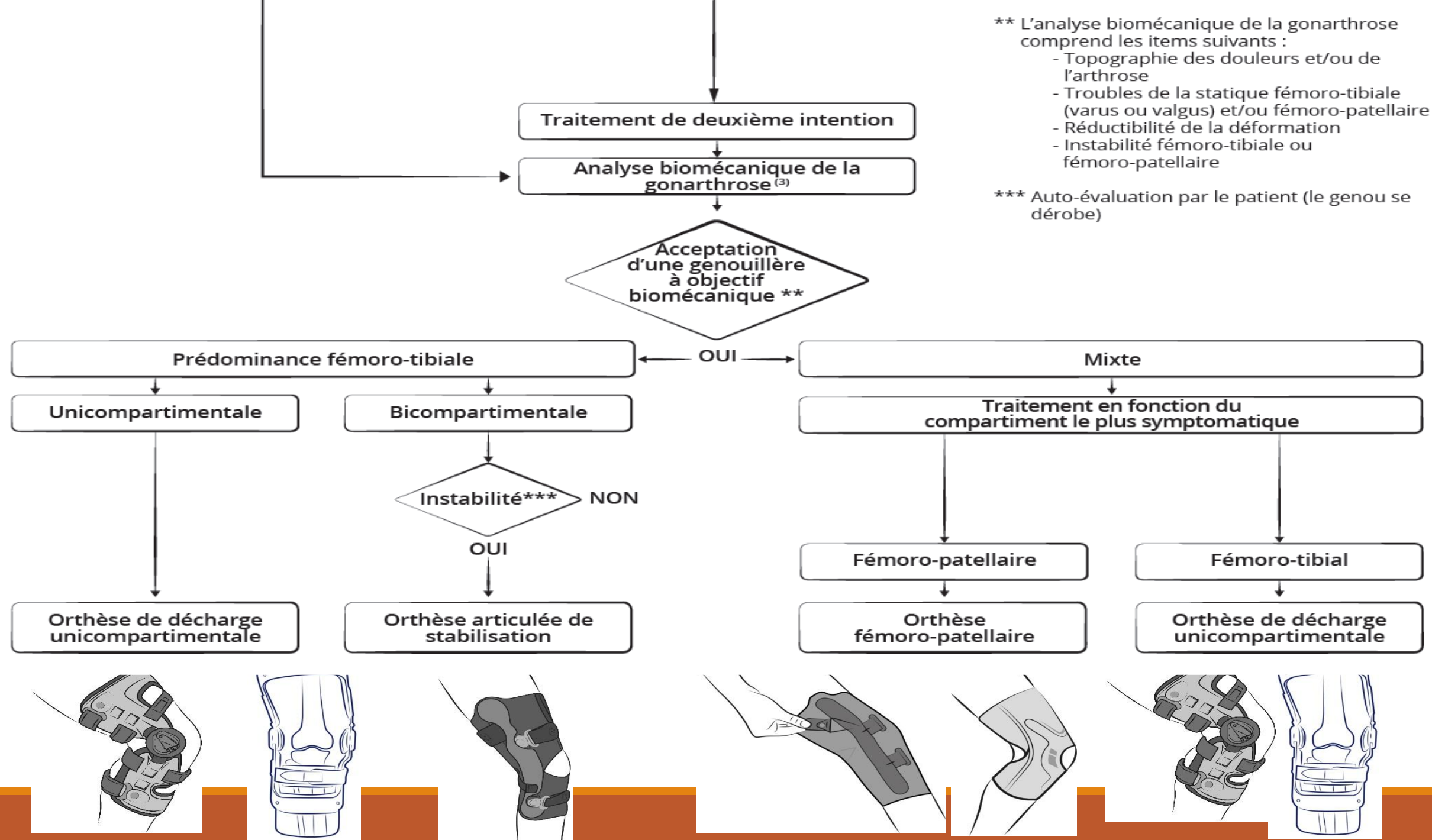
Methods: A steering committee gathered a multidisciplinary task force experienced in OA management/clinical research. Two members performed a literature review with qualitative analysis of the highest-quality randomized controlled trials and practice guidelines to confirm evidence concerning knee orthosis for OA. A first DMT draft was presented to the task force in a 1-day meeting in January 2016. The first version of the DMT was criticized and discussed regarding everyday practice issues. Every step was discussed and amended until consensus agreement was achieved within the task force. Then 4 successive consultation rounds occurred by electronic communication, first with primary- and secondary-care physicians, then with international experts. All corrections and suggestions by each member were shared with the rest of the task force and included to reach final consensus. The final version was validated by the steering committee.

Results: The definition and indication of several types of knee orthoses (sleeve, patello-femoral, hinged or unicompartamental offloading braces) were detailed. Orthoses may be proposed in addition to first-line non-pharmacological treatment if patient acceptance is considered good. At every step, a specific clinical assessment is needed.

Discussion/conclusion: Based on the latest high-level evidence, practice guidelines, and an expert panel, a DMT to facilitate daily practice prescription of knee orthoses for OA patients was designed. An evaluation of DMT implementation in a wide range of health professionals is still needed.



* Nécessité d'expliquer la mise en place de l'orthèse pour améliorer l'observance (élément clef de la réussite / échec à ce traitement)



Zoom sur la gonarthrose

Outil d'aide à la décision - Discussion

Outil d'aide à la décision $\neq$ algorithme

Rôle pédagogique

Pourrait avoir un impact qualitatif et quantitatif sur la prescription (?)

Zoom sur la gonarthrose

Conclusion

- Sous prescription des orthèses dans la gonarthrose
- Intérêt potentiel (biomécanique > clinique)
- Freins et leviers à la prescription (patients/thérapeutes)
- Déterminer les profils patients (répondeurs/adhérents)